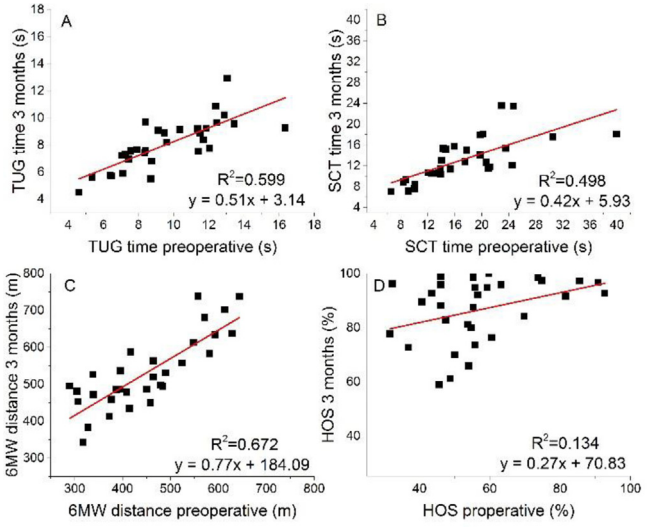
not more likely to achieve worse outcomes 3 months following the surgery. Moreover, most of the subjects were able to achieve high HOS scores 3 months following the surgery, even if they had low scores preoperatively. This may suggest that the reduction of pain following the surgery may drive the improvements in HOS. In contrast, achieving better scores on the performance-based measure may be reliant on having better functional performance prior to THA.

Table 1
Pearson correlation coefficent between preoperative and postoperative values

		3 Months postoperative				
		HHS	HOS	TUG	SCT	6MW
Preoperative	Age	.055	-.202	.509**	.472**	-.329
	BMI	-.178	-.150	.089	.239	-.308
	Pain surgical hip	-.050	-.272	.287	.258	-.328
	Hip ABD strength	-.157	.050	-.372*	-.501**	.471**
	Hip internal rotation ROM	.300	.464**	-.332	-.444*	.496**
	Knee EXT strength	-.209	.020	-.340	-.408*	.249
	HHS	.259	.231	-.236	-.233	.275
	HOS	.184	.367*	.456**	-.426*	.445*
	TUG	-.261	-.418*	.774**	.723**	-.670**
	SCT	-.200	-.404*	.589**	.706**	-.675**
	6MW	.145	.353	-.569**	-.672**	.820**

Abbreviation: HHS, Hip Harris Score; HOS, Hip Outcome Score; TUG, Timed Up-and-Go; SCT, Stair Climbing Test; 6MW, Six Minute Walk; BMI, body mass index; ABD, abductors; ROM, Range of motion; EXT, Extensor.
**, Correlation is significant at the 0.01 level (2-tailed).
*, Correlation is significant at the 0.05 level (2-tailed).



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MEASUREMENT PROPERTIES OF EXISTING CLINICAL ASSESSMENT METHODS EVALUATING SCAPULAR POSITIONING AND FUNCTION. A SYSTEMATIC REVIEW

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Purpose: From a biomechanical perspective, the scapula plays a key role in the shoulder and arm function as a stable base for optimal muscle activation both at rest and during functional tasks.There is evidence suggesting that scapular positioning are altered in patients with musculoskeletal shoulder disorders, e.g in shoulder impingement syndrome and in patients with glenohumeral osteoarthritis. Rehabilitation exercises are aiming at altering abnormal/asymmetric scapular positioning and/or function. Numerous assessment methods have measured the degree of scapular dyskinesis, subjectively by visual evaluation and objectively by measurements of static and dynamic scapular positioning, by either a 3-dimensional electromagnetic device or 2-dimensional clinically applicable methods. Since advanced equipment (i.e. 3D motion analysis) is rarely available in the clinic, the clinician needs applicable assessment tools to characterise scapular alterations.The aims were to compile a schematic overview of the available clinical scapular assessment methods and critically appraise the methodological quality of the involved studies.
Methods: A systematic, computer-assisted literature search using Medline, CINAHL, SportDiscus and EMBASE was performed from inception to October 2013. Reference lists in articles were also screened for publications. The overall method used in this review can be divided into four steps: 1) Compile an exhaustive list of scapular assessment methods on the basis of an initial search; 2) Additionally search for studies including clinimetric outcome measures of the identified assessment methods; 3) Critically appraise the methodological quality of the identified measurement properties in each study; and 4) Identify the assessment methods with acceptable results in the domains of validity and reliability as well as responsiveness, from studies which best meet the standards for acceptable methodological quality. Furthermore, the review sought to recommend clinical scapular assessment methods on the basis of acceptable results in the domains of validity and reliability as a minimum.
Results: From 50 articles, 54 method names were identified and categorised into three groups: *Static positioning assessment* ($n = 19$), *Semi-dynamic* ($n = 13$), and *Dynamic functional assessment* ($n = 22$).
Fifteen studies were excluded for evaluation due to no/few clinimetric results, leaving 35 studies for evaluation. Graded according to the COnsensus-based Standards for the selection of health Measurement INstruments (COSMIN checklist), the methodological quality in the reliability and validity domains was 'fair' (57%) to 'poor' (43%), with only one study rated as 'good'. The reliability domain was most often investigated. Few of the assessment methods in the included studies that had 'fair' or 'good' measurement properties demonstrated acceptable results for both reliability and validity.
Conclusions: We found a substantially larger number of clinical scapular assessment methods than previously reported and the methodological quality of the included measurement properties in the reliability and validity domains were in general 'fair' to 'poor'. None were examined for all three domains: reliability, validity and responsiveness. Clinically applicable assessment methods of visual observation and inclinometer measurement of scapular rotation for evaluation of scapular kinematics seem suitably evidence-based for clinical use. Future studies should test and improve the clinimetric properties of clinical assessment methods, especially also the diagnostic accuracy and responsiveness, to increase utility in clinical practice.

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INTER-EXAMINER RELIABILITY OF A TEST BATTERY FOR ASSESSING SCAPULAR POSITIONING AND FUNCTION

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Purpose: Scapular dyskinesis, defined as an abnormal positioning, and/or altered function of the scapular is often present in subacromial impingement syndrome (SIS). SIS is one of the most common shoulder disorders, which can potentially lead to degenerative conditions and/or osteoarthritis in the glenohumeral joint. Treatment of SIS primarily consists of physical therapy aiming at reducing signs of scapular dyskinesis. However, no consensus exists regarding which clinical tests to use for identifying and measuring scapular positioning and function. As a first step acceptable clinimetric measures of reliability is important, although, several tests have only been tested for intra-reliability. The aim was to investigate the inter-examiner reliability of an extended battery of clinical tests for assessing the scapular positioning and function.
Methods: A standardized three-phase protocol for clinical reliability studies was conducted, containing a training, an overall agreement and a study phase. By choosing a population of overhead athletes in the final study phase, approximately 50% of the subjects included were expected to present an obvious scapular winging (pseudo or margo medialis winging). The test battery comprised 24 clinical tests of static (six), semi-dynamic (seven) and dynamic measurements (ten) of the scapular positioning and function. Supplemental tests, such as proprioception and isometric external rotation strength with and without scapular